THE SCIENTIFIC CONGRESS.

American Association for the Advancement of Science.

FIRST DAY'S PROCEEDINGS—AFTERNOON SESSION.

ALBANY, August 20, 1856.

At half-past four, Professor HALL called the meeting to order.

Dr. D. CONTE moved to take from the table Professor Johnson's resolution to appoint a Nominating Committee to nominate candidates for the Standing Committee, as amended by Professor Agassiz. Carried.

A conversation took place between Professor Johnson, Mr. W. C. Redfield, Mr. Woolworth, Professor Hare and the Chair, in reference to the effect of the resolution, which was read.

Professor ROGERS rose and said, that if ever there had been occasion when he spoke from the bottom of his heart, it was now. That there had been an unintentional usurpation by the committee, of authority which did not belong to them, and that that usurpation was fraught with the most dangerous, if not fatal consequences to the best interests of the association, he was quite satisfied. He besought the members not to press this matter to a vote. There were many members of the association who had but just arrived; it was not fair to them to settle a question of so much importance without giving them time to vote. He proposed that the vote be postponed till to-morrow.

Mr. WOLCOTT GIBBS observed that the course now proposed to be followed had been pursued for seven years, during part of which time Professor Rogers had been a member of the committee. No evil consequences had yet ensued. He saw no reason why they should hereafter.

Dr. LE CONTE said that to-morrow had been reserved for the reading of papers, for the express purpose of having time to settle the question of the committee at this meeting.

Professor ROGERS was willing that it should be decided, if time were left for a full and free discussion. He begged the members to look at the consequences of the precedent they were establishing. He reminded them that there was a feeling abroad among the members of the association that was not favorable to the committee. He had become aware of it when he was himself a member, and it had grieved him. The only true course was to adhere to the constitution. All the trouble and discontent that exist have arisen from the departure from the constitution; and he asked what reason there could be in persevering in an open, manifest and palpable rule which stood there in the constitution before them, and to which they might so easily recur? His memory differed from that of other members. He did not think that the violation had passed into a rule; he believed that the violations had only occurred on three or four occasions.

Dr. HARE said that there had been great discontent at the action of the committee. He accused the committee of mismanagement, and said the association was in the hands of a clique.

Professor B. PIERCE said that there was no design anywhere to interfere with the fullest liberty of discussion. There was no wish to depart in any degree from the constitution, or to alter it in any way. He conceived that the speech of the gentleman (Professor Rogers) was not to the question. As to the charge of the association being managed by a clique, he denied it. That certain gentlemen were not on the committee did not prove that it was managed by a clique.

Professor AGASSIZ said he was not a member of the Standing Committee. He advocated the adoption of their recommendation solely because he thought it would save time. It was the simplest plan to say "yes" to what they proposed.

Professor MITCHELL hoped that the question would now be settled. He saw no objection to a strict adherence to the constitution. Let persons arise in their seats and nominate candidates.

Professor AGASSIZ would not consent to pass an implied vote of censure on the committee.

Prof. MITCHELL thought time could be best saved by recurring to the constitution.

The CHAIR explained, and concluded by asking what the gentleman would ask next?

Prof. MITCHELL, with some warmth, said that he had spoken in a conciliatory manner, and he found himself checked by the Chair. He resented it.

A MEMBER proposed a committee to examine the question at issue, and report upon it.

Prof. ROGERS observed that the revised constitution, which was now in the hands of a committee, would answer the purpose.

After some further conversation, in which Prof. Bache, Prof. Rogers and others joined, the resolution, as amended, was put to the vote and lost.

Prof. JOHNSON called for the reading of the seventh rule.

Prof. WOLCOTT GIBBS said that the Standing Committee had a right to recommend names to the association. Every public body had such a right.

Prof. ROGERS—Not to fill their own body.

Prof. PIERCE moved that the recommendation of the committee be brought before the association as a nomination, and that the meeting proceed to a ballot. Carried.

Prof. HARE nominated Prof. Rogers.

Professor PIERCE proposed that the meeting proceed to ballot on the first name on the list, which was that of Professor Bache.

Messrs. Steiner and Blake were appointed scrutineers.

The result of the ballot was 49 for Bache, 13 ayes (total for Bache 62); 2 for Rogers, 1 for Johnson, 2 for Mitchell 7 noes, 1 for Lieut. Bache, 1 for Steiner and 1 for Page.

Prof. ROGERS then begged to be allowed to nominate Messrs. Wyman, Le Conte, Coffin and Caswell, and asked that they be balloted for. He observed that they were the same names as were on the ticket proposed by the committee, but they were men nominated by him. He added that he would have nominated Sir Wm. E. Logan also, but that the constitution required that members of the committee should have been for some time previous members of the association; and therefore, Sir William (to whom he paid a high tribute) was ineligible.

Prof. BACHE denied the truth of the argument. There was nothing to prevent a constituency from electing an ineligible man, if they chose. The question of his eligibility could only be raised after his election. He, for one, would vote for Sir Wm. E. Logan.

Prof. ROGERS said he would add Sir W. E. Logan's name with great pleasure.

Dr. HARE did not see the use of a constitution if it was to be violated in this way.

Prof. AGASSIZ thought the object of the association was for a few men interested in science to get together in a friendly way, and talk over their studies; for his part he thought the less they heard of Parliamentary rules and restrictions the better. They could get on very well without the consitution.

The second name on the list—Prof. Wyman—having been balloted for, the result of the ballot was now read: 63 Wyman, 1 Johnson, 3 Rogers, 3 noes.

The meeting then proceeded to vote on the five names proposed by Prof. Rogers, the result being as follows:—15 ayes 55 Leconte, 53 Coffin, 52 Logan, 54 Caswell, 1 Rogers, 2 blanks, 5 noes, 1 Fremont, and 1 for "a person named Jessie," said the Secretary.

Prof. WOLCOTT GIBBS moved that Prof. Pierce be requested to continue his communication on potential arithmetic.

Prof. PIERCE thought it would be better for the section. It was a sectional matter.

Dr. LECONTE thought they had better dis sect it.

Prof. PIERCE proceeded to prove on the black board how fifteen girls could be divided for seven days into different sets of three, one set lasting for each day, and yet no two girls ever being in the same set. The demonstration was unintelligible to all but those initiated in transcendental mathematics.

The meeting then adjourned.

LIST OF THE STANDING COMMITTEE.

President, James Hall, of Albany; Permanent Secretary, Jos. Levering, of Cambridge; General Secretary, B. A. Gould, of Albany; Treasurer, A. L. Elcoyn, of Philadelphia; Professor John Torrey, of New York; Prof. Walcott Gibbs, of New York; Prof. Wm. B. Rogers, of Boston; Mr. Wm. P. Blake, of Washington; Prof. Benj. Pierce, of Cambridge; Prof. Chauvenet, of Annapolis; Prof. A. D. Bache, of Washington; Prof. Jeffries Wyman, of Cambridge; Prof. John L. LeConte, of South Carolina; Prof. Coffin, of Pennsylvania; Sir Wm. E. Logan, of Montreal; Prof. A. Caswell, of Providence.

ACOUSTICS AS APPLIED TO PUBLIC BUILDING, BY PROFESSOR HENRY, OF THE SMITHSONIAN INSTITUTION.

At the meeting of the American Association, in 1854, I gave a verbal account of a plan of a lecture room adopted for the Smithsonian Institution, with some remarks on acoustics as applied to apartments intended for public speaking. At that time the room was not finished, and experience had not proved the truth of the principles on which the plan had been designed. Since then the room has been employed for two winters for courses of lectures to large audiences, and I believe its is the universal opinion of those who have been present that the arrangement for seeing and hearing, considering the size of the apartment, is entirely unexceptionable. It has certainly fully answered all the expectations which were formed in regard to it previous to its construction.

The President of the United States directed Capt. Meigs to confer with Prof. Bache and myself in regard to the acoustics of the new rooms in the ante-room of the Capitol. Previous to this we first studied the peculiarities of the present hall of the House of Representatives. This is allowed to be one of the worst possible apartments for public speaking; and to determine the cause of the confusion of sounds which exists during debate, is of considerable importance in suggesting improvements in the arrangement of the new rooms. We afterwards examined the principal churches and halls in Philadelphia, New York and Boston, and the peculiarities of these, as far as the investigation extended, may be referred to a few well established principles of sound which have been applied to the construction of this lecture room. To apply them generally, however, in the construction of public halls requires a series of preliminary experiments.

In every small apartment it is an easy matter to be heard distinctly at every point, but in a large room, unless from the first in the original plan of the building provision be made on acoustic principles for a suitable form, it will be difficult, and indeed in most cases impossible, to produce the desired result. The same remark may be applied to lighting, heating and ventilation and to all the special purposes to which a particular building is to be applied. I beg, therefore, to make some preliminary remarks on the architecture of buildings bearing on this point, which, though they may not meet with universal acceptance, will, I trust, commend themselves to the common sense of the public in general.

In the erection of a building, the uses to which it is to be applied should be clearly understood, and provision definitely made for every desired object.

Modern architecture is not a fine art par excellence, like painting or sculpture; the object of the latter is to produce a moral emotion, or awaken the feelings of the sublime or the beautiful, and we egregiously err when we apply their productions to a merely utilitarian purpose. To make a fire screen of Ruben's Madonna, or a candelabrum of the statue of the Apollo Belvidere, would be to debase these exquisite productions of genius, and to do violence to the feelings of the cultivated lover of art. Modern buildings are made for other purposes than artistic effect, and in them the esthetical must be subordinate to the useful; then the two may coexist, and an intellectual pleasure be derived from a sense of adaptation and fitness, combined with a perception of harmony of parts and the beauty of detail.

The buildings of a country should be an ethnological expression of the wants, habits, art and sentiment of the time in which they are erected. Those of Egypt, Greece and Rome were intended at least, in part, without the art of printing, to transmit to posterity an idea of the character of the periods in which they were erected. It was by these monuments that these nations sought to impress an idea of their religious and political sentiment on future ages.

The Greek architect was untrammelled by any condition of utility. Architecture was with him, in reality, a fine art. The temple was formed to gratify the popular deity. The minutest parts were exquisitely finished, since nothing but perfection on all sides, and in the smallest particular, can gratify an all seeing and critical eye. It was intended for external worship, and not internal use. It was without windows, and entirely open to the sky, or if closed with a roof the light was merely admitted through a large door. There were no arrangements for heating or ventilation. The uses, therefore, to which, in modern times, buildings of this kind can be applied, are exceedingly few; and though they were objects of great beauty and fully realized the intention of the architect when originally constructed, yet they cannot be copied in our days without violating the principles which should govern in architectural adaptation.

Every vestige of ancient architecture which now remains on the face of the earth should be preserved with religious care; but to servilely copy those, and to attempt to apply them to the uses of our day, is as preposterous as to attempt to harmonize the refinement of civilization of the present age with the superstition of the times of the Pharohs. It is only when a building expresses the dominant sentiment of an age, when a perfect adaptation to its use is joined to harmony of proportions and an outward expression of its character, that it is entitled to our admiration. It has been aptly said that it is one thing to adopt a particular style of architecture, but a very different one to adapt it to the purpose intended.

Architecture should not only change with the character of the people, and in some cases with the climate, but also with the material to be employed in construction. The introduction of iron and of glass requires an entirely different style from that which sprung from the canes of Egypt, the masses of marble from which the lintels of the Grecians temples are formed, or the introduction of brick by the Romans.

The great tenacity and power of resistance to crushing of iron as a building material, should point out for it a far more slender and apparently lighter arrangement of parts. An entire building of iron, fashioned in imitation of stone, might be erected at small expense of invention on the part of the architect, but would do little credit to his truthfulness or originality. The same may be said of our modern pasteboard edifices, in which, with their battlements, towers, pinnacles, "fretted roofs and long drawn aisles," cheap and transient magnificence is produced by painting wood or decorated plaster. I must not, however, indulge in remarks of this kind, but must curb my feelings in regard to this subject, since I speak from peculiar experience.

But to return to the subject of acoustics as applied to apartments intended for public speaking. While sound, in connection with its analogies with light and in its abstract principles, has been investigated within the last fifty years with a rich harvest of results, few attempts have been successfully made to apply these principles to practical purposes. Though we may have a clear idea of the abstract operation of a law of nature, yet when the conditions are varied and the actions multiplied, the results frequently transcend our powers of logic, and we are obliged to appeal to experiment and observation, not only to assist in deducing consequences, but also to verify those which have been arrived at by logical deduction. Furthermore, though we may know the manner in which a cause acts to produce a given effect, yet in all cases we are obliged to ascertain the measure of effect under given conditions.

The science of acoustics as applied to buildings, perhaps more than any other, requires this union of scientific principles with experimental deductions. While on the one hand the simple deductions from the established principles of acoustics would be unsafe from a want of knowledge of the constants which enter into our formula, on the other hand empirical data alone are in this case entirely at fault, and of this any person may be convinced who will examine the several works written on acoustics by those who are deemed practical men.

Sound is a motion of matter capable of affecting the ear with a sensation peculiar to that organ. It is not in all cases simply a motion of the air, for there are many sounds in which the air is not concerned. For example, the impulses which are conveyed along a rod of wood from a burning fork to the teeth. When a sound is produced a single impulse, or an approximation to a single impulse, it is called a noise—when a series of impulses, a continued sound, &c.; if the impulses are equal in duration among themselves, a musical sound. This has been illustrated by a quill striking against the teeth of a wheel. A single impulse from one tooth is a noise, from a series of teeth in succession a continued sound, and if all the teeth are at equal distances, and the velocity of the wheel is uniform, then a musical note is the result. Each of these sounds is produced by the human voice, though they apparently run into each other. Usually, however, in speaking, a series of irregular sounds of short duration are emitted—each syllable of a word constitutes a separate sound of appreciable duration, and each compound word and sentence an assemblage of such sounds. It is astonishing that in listening to a discourse the ear can receive so many impressions in the course of a second, and that the mind can take cognizance of and conquer them.

That a certain force of impulse, and a certain time for its continuance are necessary to produce an audible impression on the ear is evident; but it may be doubted whether the impression of a sound on this organ is retained appreciably longer than the continuance of the impulse itself. Certainly not longer than the 1-10th of a second. If this were the case, it is difficult to conceive why articulate discourse which so pre-eminently distinguishes man from the lower animals, should not fill the ear with a monotonous hum; but whether the ear continues to vibrate, or whether the impression remains a certain time on the sensorium, it is certain that no sound is ever entirely instantaneous, or the result of a single impression, particularly in enclosed spaces. Every impulse must give rise to a forward, and afterwards to a backward motion of the atom. The impulse is not only communicated to the ear but to all bodies around, which in turn, themselves become centres of reflected impulses.

Sound from a single explosion in air equally elastic on all sides tends to expand equally in every direction; but when the impulse is given to the air in a single direction, though an expansion takes place on all sides, it is much more intense in the line of the impulse. For example, the impulse of a single explosion, like that of the detonation of a bubble of oxygen, is propagated equally in all directions; while the discharge of a cannon, while heard on every side, is much louder in the direction of the axis; so, also, a person speaking is heard much more distinctly in front than at an equal distance behind. Many experiments have been made on this point, and I may mention those repeated in the open space in front of the Smithsonian Institution. In a circle one hundred feet in diameter, the speaker in the centre and the hearer in succession at different points of the circumference, the voice was heard distinctly directly in front, gradually less so on either side, until in the rear it was scarcely audible. The rates of distance for distinct hearing directly in front, on the sides and in the rear were about as 100, 75 and 30.

These numbers may serve to determine the form in which an audience should be arranged in an open field, in order that those on the periphery of the space may all have a like favorable opportunity of hearing, though it should not be recommended as the interior form of an apartment in which a reflecting wall would be behind the speaker.

The impulse producing sound requires time for its propagation, and thus depends upon the intensity of repulsion among the atoms; and, secondly, on the specific purity of the matter itself. If the medium were entirely rigid, sound would be propagated instantaneously. The weaker the repulsion between the atoms, the greater will be the time required to transmit the motion from one to the other; and the heavier the atoms, the greater will be the time required for the action of a given force to produce in them a given amount of motion. Sound, also, in meeting an obstacle is reflected in accordance with the law of light, making the angle of incidence equal to the angle of reflection. The tendency, however, to a divergency in a single beam of sound, appears to be much greater than that in the case of light. The law, however, appears to be definitely observed in the case of all beams that are reflected in a direction near the perpendicular. It is on the law of the propagation and reflection of sound, that the philosophy of echo depends. Knowing the velocity of sound, it is an easy matter to calculate the interval of time which elapses between the original impulse and the return of the echo. Sound moves at the rate of 1,125 feet in a second at the temperature of 60 degrees. If, therefore, we stand at half this distance before a wall, the echo will return to us in one second. It is, however, a fact known from universal experience, that no echo is perceptible from a near wall, though one in all cases must be sent back to the ear; the reason of this is that the ear cannot distinguish the difference between the similar sounds, as, for example, that from the original impulse and its reflection, if they follow each other at less than a given interval, which can only be determined by actual experiment; and as this is an important element in the construction of buildings, the attempt was made to determine it, with some considerable degree of accuracy. For this purpose the observer was placed immediately in front of the wall of the west end of the Smithsonian building, at the distance of 100 feet; the hands were then clapped together, a distant echo was perceived, the elapsed time of the passage of the impulse from the hand to the ear, and that from the hand to the wall and back to the ear was sufficiently great to produce two entirely distinct impressions. The observer then gradually approached the building until no echo or perceptible prolongation of the sound was observed. By accurately measuring this distance, and doubling it, we find the interval of space within which two sounds may follow each other without appearing separately. But if two rays of sound reach the ear without having passed through distances differing from each other greater than this, they produce the effect of separate sounds. This distance we have called the limit of perceptibility in terms of space. If you divide this distance into the velocity of sound, we ascertain the limit of perceptibility in time.

In the experiment just made with the wall a source of error was discovered, in the fact that a portion of the sound returned was reflected from the cornice under the eaves, and as this was at a greater distance than the part of the wall immediately perpendicular to the observer, the moment of the cessation of the echo was less distinct. In subsequent experiments with a louder noise the reflection was observed from a perpendicular surface of about twelve feet square, and from this more definite results were obtained. The limit of the distance in this case was about thirty five feet, varying slightly, perhaps, with intensity of the sound and the acuteness of different ears. This will give about one-sixteenth of a second as the limit of time at which the ear can separately distinguish two similar sounds. From this experiment we learn that the reflected sound may tend to strengthen the impression or to confuse it, according as the difference of time between the two impressions is greater or less than the limit of perceptibility. An application of the same principle gives us the explanation of some phenomena of sound which have been considered mysterious. Thus, in the reflection of an impulse from the edge of a forest of trees, each leaf properly situated within a range of thirty feet of the front plane of reflection, will conspire to produce a distinct echo, and these would form the principal part of the reflecting surfaces of a dense forest, for the remainder would be screened, and being at a greater distance every ray which might come from them would serve to produce merely a low continuation of the sound.

On the same principle we may at once assert that the panneling of a room, or even the introduction of reflecting surfaces at different distances, will not prevent the echo, provided they are parallel to each other, and situated relatively to each other within the limit of perceptibility.

Important advantage may be taken of the principle of the reflection of sound by the proper arrangement of the reflecting surfaces behind the speaker. We frequently see in churches, as if to diminish the effect of the voice of the preacher, a mass of drapery placed directly in the rear of the pulpit. However important this may be in an æsthetical point of view, it is certainly at variance with correct acoustic arrangements—the great object of which should be to husband every articulation of the voice, and to transmit it unmingled with other impulses and with as little loss as possible to the ears of the audience.

Another effect of the transmission and reflection of sound, is that which is called reverberation, which consists of a prolonged musical sound, and is much more frequently the cause of indistinctness of perception of the articulations of the speaker than the single echo.

Reverberation is produced by repeated reflection of a sound from the walls of the apartment. If, for example, a single detonation takes place in the middle of a long hall, with naked and perpendicular walls, an impulse will pass in each direction, will be reflected from the walls, cross each other again at the point of origin, be again reflected, and so on until the original impulse is entirely absorbed by the solid materials which confine it. The impression will be retained upon the ear during the interval of the transmission past it of two successive waves, and thus a continued sound will be kept up, particularly if the walls of any part of the room are within thirty-five feet of the ear. If a series of impulses, such as those produced by the rapid snaps of the teeth of a wheel against a quill, be made in unison with the echoes, a continued musical sound will be the result. Suppose the wheel to be turned with such velocity as to cause a snap at the very instant the return echo passes the point at which the apparatus is placed, the second sound will combine with the first, and thus a loud and sustained vibration will be produced. It will be evident from this that every room has a key note, and that if an instrument be sounded on this, it will resound with great force. It must be apparent also that the continuance of a single sound and the tendency to confusion in distinct articulation will depend on several conditions—first, on the size of the apartment; second, on the strength of the sound, or the intensity of the impulse; third, on the position of the reflecting surface; and, fourth, on the nature of the material of the reflecting surfaces.

In regard to the first of these, the larger the room, the longer time will be required for the impulse to reach the wall along the axis; and if we suppose that at each collision a portion of the original force is absorbed, it will require double the time to totally extinguish it in a room of double the size, because the velocity of sound being the same, the number of collisions in a given time will be inversely as the distance through which the sound has to travel.

Again, that it must depend upon the loudness of the sound, or the insecurity of the impulse must be evident when we consider that the cessation of the reflections is due to the absorption of the walls or irregular reflection, and that consequently the greater the amount of original disturbance the longer will be the time required for its complete extinction. This principle was abundantly shown by our observations on different rooms.

Thirdly, the continuance of the resonance will depend upon the position of the reflecting surfaces. If these are not parallel to each other, but oblique, so as to reflect the sound, not to the opposite but to the adjacent wall, without passing through the longer axis of the room, it will evidently be sooner absorbed. Any obstacle also which may tend to break up the wave and interfere with the reflection through the axis of the room, will serve to lessen the resonance of the apartment. Hence, though the panelling the ceiling and introducing a variety of oblique surfaces may not prevent an isolated echo, provided the distance be sufficiently great and the sound sufficiently loud, yet that they do have an important effect in stopping the resonance is evident from theory and experiment. In a room fifty feet square, in which the resonance of a single intense sound continued six seconds, where cases and other objects were placed around the wall, its continuance was reduced to two seconds.

Fourthly, the duration of the resonance will depend on the nature of the material of the wall. A reflection always takes place at the surface of a new medium, and the amount of this will depend on the elastic force or power to resist compression, and the density of the new medium. For example, a wall of nitrogen, if such could be found, would transmit nearly the whole of a wave of sound in air, and reflect but a very small portion. A partition of tissue paper would produce nearly the same effect. A polished wall of steel, however, of sufficient thickness to prevent yielding, would reflect, for practical purposes, all the impulses through the air which might fall upon it. The rebound of the wave is caused not by the oscillation of the wall, but the elasticity and mobility of the air. A single ray of sound striking against a yielding board would probably increase the loudness of the reverberation, but not its continuance. On this point a series of experiments were made by the use of the tuning fork. In this instrument the motion of the foot and of the two prongs give a sonorous vibration to the air, which, if received upon another tuning fork of precisely the same size and form, would reproduce the same vibrations.

It is a fact well established by observation, that when two bodies are in perfect unison, and separated from each other by a space filled with air, the vibrations of the one will be transmitted to the other. From this consideration it is probable that very nearly the same effect ought to be produced in transmitting immediately the vibration of a tuning fork to a reflecting body as to duration and intensity, as in the case of transmission through air. This conclusion is strengthened by floating a flat piece of wood in a vessel of water standing upon a sounding board; placing a tuning fork on this, the vibrations will be transmitted to the board through the water, and sounds will be produced of the same character as those emitted when the tuning fork is placed directly on the board. A tuning fork was suspended from a fine cambric thread, vibrated in air, and, from the mean of a number of experiments, was found to continue in motion 252 seconds. In this experiment, had the tuning fork been in a perfect vacuum, suspended without the use of a string, and further, had there been no etherial medium, the agitation of which would not give rise to light, heat, electricity, or some other form of etherial motion, the fork would continue its vibration forever.

The fork was next placed upon a large thin pine board—the top of a table. A loud sound, in this case, was produced, which continued less than 10 seconds. The whole table, as a system, was thrown into motion, and the sound produced was as loud on the under side as on the upper side. Had the tuning fork been placed upon a partition of this material, a loud sound would have been heard in the adjoining room; this was proved by sounding the tuning fork against a door leading into a closed closet. The sound within was apparently as loud as that without.

The rapid decay of sound in this case was produced by the great amount of the motive power of the fork being communicated to a large mass of wood. The increased sound was due to the increased surface. In other words, the shortness of duration was compensated for by the greater intensity of effect produced.

The tuning fork was next placed upon a circular slab of marble, about three feet in diameter and three-fourths of an inch thick; the sound emitted was feeble, and the undulations continued 115 seconds, as deduced from the mean of six experiments.

In all these experiments, except the one in a vacuum, the time of the cessation of the tuning fork was determined by bringing the mouth of a resounding cavity near the end of the fork; this cavity, having previously been adjusted to unison with the vibrations of the fork, gave an audible sound when none could be heard by the unaided ear.

The tuning fork was next placed upon a cube of India rubber, and this upon the marble slab. The sound emitted in this case was scarcely that in the case of the tuning fork suspended from the cambric thread; and from this analogy of the previous experiments we might at first thought suppose the time of duration would be great—but this was not the case; the vibrations continued only forty seconds. The question may here be asked, what became of the impulses lost by the tuning fork? They were neither transmitted to the India rubber, nor given off to the air in the form of sound, but were probably expended in producing a change in the matter of the India rubber, or were converted into heat, or both. Though the inquiry did not fall strictly within the line of this series of investigation, yet it was of so interesting a character, in a physical point of view, to determine whether heat was actually produced, that the following experiment was made:—

A cylindrical piece of India rubber about 1½ inches diameter, was placed in a tubulated bottle with two openings, one near the bottom and the other at the top; a stuffing box was attached to the upper, through which a metallic stem, with a circular foot to press upon the India rubber, was made to pass, air tight. The lower tubular was closed with a cork, in a perforation of which a fine glass tube was cemented; a small quantity of red ink was placed in the hole to serve as an index. The whole arrangement thus formed a kind of thermometer which would indicate a certain amount of change of temperature in the inclosed air. On the top of the stem the tuning fork was screwed, and consequently its vibrations were transmitted to the rubber within the bottles. The glass was surrounded with several coatings of flannel to prevent the influence of the external temperature. The tuning fork was then sounded, and the vibrations were kept up for some time. No reliable indications of an increase of temperature were observed. A more delicate method of making the experiment next suggested itself. The tube containing the drop of red ink, with its cork, was removed, and the point of a compound wire formed of copper and iron was thrust into the substance of the rubber, whilst the other ends of the wire were connected with a delicate galvanometer. The needle was suffered to come to rest. The tuning fork was then vibrated, and its impulses transmitted to the rubber. A very perceptible increase of temperature was the result. The needle moved through an arc of from one to two and a half degrees. The experiment was varied, and many times repeated; the motions of the needle were always in the same direction, viz: in that which was produced when the point of the compound wire was heated by momentary contact with the fingers. The amount of heat generated in this way is, however, small, and indeed in all cases in which it is generated by mechanical means the amount evolved appears very small in comparison with the labor expended in producing it. Jule has shown that the mechanical energy generated in a pound weight, by falling through a space of 750 feet, elevates the temperature of a pound of water one degree.

It is evident that an object like India rubber actually destroys a portion of the sound, and hence in cases in which entire non-conduction is required, this substance can probably be employed with perfect success.

The tuning fork was next pressed upon a solid brick wall. The duration of vibration, from a number of trials, was eighty eight seconds. Against a wall of lath and plaster the sound was louder, and continued only eighteen seconds.

From these experiments we may infer that if a room were lined with a wainscot of thin boards, and a space left between the wall and the wood, the loudness of the echo of a single noise would be increased, while the duration of the echo would be diminished. If, however, the thin board were glued or cemented in solid connection to the wall, or embedded in the mortar, then the effect would be a feeble echo, and a long continued resonance similar to that from the slab of marble. This was proved by first determining the length of continuance of the vibrations of a tuning fork on a thin board, which was afterwards cemented to a flat piece of marble.

A series of experiments were next commenced with reference to the actual reflection of sound. For this purpose a parabolic mirror was employed, and the sound from a watch received on the mouth of a hearing trumpet, furnished with a tube for each ear. The focus was near the apex of the parabola, and when the watch was suspended at this point it was six inches within the plane of the outer circle of the mirror. In this case the sound was confined at its origin and prevented from expanding. No conjugate focus was produced, but, on the contrary, the rays of light, when a candle was introduced, constantly diverged. The ticking of the watch could not be heard at all when the ear was applied to the outside of the mirror, while directly in front it was distinctly heard at the distance of thirty feet, and, with the assistance of the ear trumpet, at more than double that distance. When the watch was removed from the focus the sound ceased to be audible. This method of experimenting admits of considerable precision, and enables us to directly verify, by means of sound transmitted through air, the results anticipated in the previous experiments. A piece of tissue paper placed within the mirror, and surrounding the watch without touching it, slightly diminished the reflection. A simple curtain of flannel produced a somewhat greater effect, though the reflecting power of the metallic parabola was not entirely masked by three thicknesses of flannel, and I presume very little change would have been perceived had the reflector been lined with flannel glued to the surface of the metal. The sound was also audible at the distance of ten feet, when a large felt hat, without stiffening, was interposed between the watch and the mirror. Care was taken in these experiments so to surround the watch that no ray of sound could pass directly from it to the reflecting surface.

With a cylindrical mirror with parabolic base very little increased reflection was perceived. The converging beams were merely in this case in a simple plane perpendicular to the mirror, and passing through the ear, while to the focal point of the spherical mirror a solid cone of rays was sent.

The reflection from the cylindrical mirror forms what is called a "caustic" in optics, while that from a spherical mirror gives a true focus, or, in other words, collects the sound from all parts of the surface, and conveys them to one point of space. These facts furnish a ready explanation of the confusion experienced in the Hall of Representatives, which is surmounted by a dome, the under surface of which acts as an immense concave mirror, reflecting to a focus every sound which ascends to it, leaving other points of space deficient in sonorous impulses.

Water and other liquids, which offer great resistance to compression, are good reflectors of sound. This may be shown by the following experiment:—When water is gradually poured into an upright cylindrical vessel, over the mouth of which a tuning fork is vibrated until it comes within a certain distance of the mouth, it will reflect an echo in unison with the vibrations of the fork, and produce a loud resonance. This result explains the fact, which had been observed with some surprise, that the duration of the resonance of a newly plastered room was not perceptibly less than that of one which had been thoroughly dried.

There is another principle of acoustics which has a bearing on this subject. I allude to the refraction of sound. It is well known that when a ray of sound passes from one medium to another change in velocity takes place, and consequently a change in the direction or refraction must be produced. The amount of this can readily be calculated where the relative velocities are known. In rooms heated by furnaces, and in which streams of heated air pass up between the audience and speaker, a confusion has been supposed to be produced, and distinct hearing interfered with by this cause. Since the velocity of sound in air at 32 degrees of Fahrenheit has been found to be 1,090 feet in a second, and since the velocity increases 1.14 feet for every degree of Fahrenheit, if we know the temperature of the room and that of the heated current, the amount of angular refraction can be ascertained. But since the ear does not readily judge of the difference of direction of two sounds emanating from the same source, and since two rays do not confuse the impression which they produce upon the ear, though they arrive by very different routes, provided they are within the limit of perceptibility, we may therefore conclude that the indistinctness produced by refraction is comparatively little. Professor Bache and myself could perceive no difference in distinctness in hearing from rays of sound passing over a chandelier of the largest size, in which a large number of gas jets were in full combustion. The fact of disturbance from this cause, however, if any exist, may best be determined by the experiment with a parabolic mirror and the hearing trumpet before described.

These researches may be much extended; they open a field of investigation equally interesting to the lover of abstract science and to the practical builder. And I hope, on behalf of the committee, to give some further facts with regard to this subject at another meeting.

I will now briefly describe the lecture room which has been constructed in accordance with the facts and principles stated above, so far, at least, as they could be applied.

There was another object kept in view in the construction of this room—besides the accurate hearing, the distinct seeing. It was desirable that every person should have an opportunity of seeing the experiments which might be performed as well as hear distinctly the explanation of them.

By a fortunate coincidence of principles, it happens that the arrangements for ensuring unobstructed sight do not interfere with those necessary for distinct hearing.

The law of Congress authorizing the establishment of the Smithsonian Institution directed that a lecture room should be provided, and accordingly in the first plan one-half of the first story of the main building was devoted to this purpose. It was found, however, impossible to construct a room on acoustic principles in this part of the building which was necessarily occupied by two rows of columns. The only suitable place which could be found was therefore on the second floor. The main building is 200 feet long and 50 feet wide; but by placing the lecture room in the middle of the story a greater width was obtained by means of the projecting towers. The general form and arrangement of the room will be understood from the accompanying drawing. (Here the speaker referred to a drawing and explained it.)

The main gallery is in the form of a horse shoe, and occupies three sides of the room. The speaker's platform is placed between two oblique walls. The corners of the room which are cut off by these walls afford recesses for the stairs into the galleries. The opposite corners are also partitioned off so as to afford recesses for the same purpose.

The ceiling is twenty-five feet high, and therefore within the reach of perceptibility. It is perfectly smooth and unbroken, with the exception of an oval opening near the platform, through which light is admitted.

The seats are arranged in a curved form, and were intended to rise in accordance with the panoptic curve originally proposed by Professor Bache, which enables every individual to see over the head of the person immediately in front of him. The original form of the room, however, did not allow of this intention being fully realized, and therefore the rise is somewhat less than the curve would indicate. The general appearance of the room is somewhat fan shaped, and the Speaker is placed as it were in the mouth of an immense trumpet. The sound directly from his voice, and that from reflection immediately behind him, is thrown forward upon the audience, and as the difference of the distance travelled by the two rays is much within the limit of perceptibility, no confusion is produced by direct and reflected sound. No echo is given off from the ceiling, for this is also within the limit of perceptibility, while it assists the hearing in the gallery by the reflection to that place of the oblique rays.

Again, on account of the oblique walls behind the speaker, and the multitude of surfaces, including the gallery pillars, stair screens, &c., as well as the audience, directly in front all reverberation is stopped.

The walls behind the speaker are composed of lath and plaster, and therefore have a tendency to give a more intense though less prolonged sound than if of solid masonry. They are also intended for exhibiting drawings to the best advantage.

The architecture of this room is due to Captain Alexander, of the corps of Topographical Engineers. He fully appreciated all the principles of sound which I have given, and varied his plans until all the required conditions, as far as possible, were fulfilled.

Our Special Correspondence.

ALBANY, Aug. 21—A. M.

The discussion last evening had one good effect—it prevented people noticing that the religious ceremonies in which Bishop Potter was to have played a part, were quietly dropped. The fact was, the Bishop, after being duly advertised, did not come; and as it was raining in torrents, that part of the celebration was struck from the programme, to the regret of few among the savants.

I touched in a former letter on the question at issue between Professors Johnson, Rogers and others and the Standing Committee. As I am not a member of the Association, and may, therefore venture to call things by their names, I will say that the charge privately made against the committee is that they control the Association without authority, and by usurping the right of nominating their successors—a nomination in this case being equivalent to an election—make a clique affair of it. This was the charge as put by Dr. Hare, and as understood by others, who did not say so in so many words. On the other hand, the friends of the committee urge that the Association, being an open body, into which every one can obtain admission, no business could be transacted with expedition or safety, were there not a controlling body, composed of reliable men, to direct the unwieldy corporate machine. They further urge that as there is a great disinclination in a body of this kind to vote against any one, were the nominations of the Standing Committee thrown open, persons most unfit to be members might be nominated and elected, to the detriment of the true interests of the association. I confess I am not impressed by the force of these arguments. I think it likely that a body possessing supreme power and perpetual succession, as the Standing Committee appear to have had, would, in effect, be exposed to the temptation of assuming somewhat more sway over the constituent body than might be wholesome; while I can easily understand how even the semblance of a usurpation would provoke criticism and dissatisfaction, and interfere with the harmony of the associate proceedings. And of two evils, the chance of an unfortunate election of a committeeman would be certainly less fraught with danger than the existence of a factious spirit in the association.

Professor Rogers, late of Virginia, now of Boston, was the leader on the opposition side. He is, I think, the most striking debater in the association. A man of fine carriage, and gentle, manly bearing, he speaks eloquently and forcibly; he certainly had the advantage of his opponents in the debate. On his side, also, Professor Johnson, of Middleton, Conn., was among the athletes; while old Dr. Hare, the spiritualist, who has a private grudge against the committee, made some pungent remarks. The committee was defended by the Chair—Prof. Hall—who espoused their cause with perhaps more zeal than might have been expected from a presiding officer, and Prof. Walcott Gibbs, of New York. These were supported by Prof. Pierce, of Cambridge, a man of a good deal of force; and Prof. Agassiz threw in a remark, from time to time, with telling effect. He speaks little, but always shrewdly, forcibly and to the point. The battle was won at last by the opposition. Professor Rogers took the committee's list of nominations, and moved them himself, thus superseding the nomination of the committee. The gentlemen thus proposed were balloted for and elected. This will form a precedent for the future. Next year any member will be at liberty to nominate whom he pleases, and demand a ballot, which is all the opposition desire.

Prof. Pierce's continuation of his study of transcendental mathematics was the most deceptive performance imaginable. He set out with telling us that he would now show us how fifteen girls could be arranged in five sets of three on each day for seven days, and that no two girls should be twice in the same set. At this the ladies in the gallery pricked up their ears, and looked much interested, while the juvenile members of the association (by which I mean men under forty) laughed, and made the obvious jokes suggested by such a problem. But when the Professor began, the scene changed. There was a girl named A, whom he set in a corner, and there were seven girls of the name of B, whom he manœuvred up and down the black board, like persons at chess, and at last planted in rows like corn; then came seven girls of the name of C, who were tormented in like fashion, and finally, somehow set a top of the Miss B's; then came the D's, who were still harder to dispose of; and so on, till our brains were all in a muddle, and I noticed a pretty girl in the gallery with a lovely New York hat dropping quietly to sleep with a mournful expression of face, no doubt occasioned by her sympathy for the Miss G's and F's, and the rest, who were still to be manipulated by the learned Professor. I venture to say that no boarding schoolmistress would ever be able to organise her school in trios according to the problem of the Professor; the practical benefit of this problem remains to be discovered.

Members are still coming in. There is a talk of the association meeting next year in Montreal. The Southerners would probably object to go so far.

The Great Storm at the South.

FURTHER PARTICULARS OF THE LAST ISLAND CALAMITY—NAMES OF THE LOST, ETC.

[From the New Orleans Picayune, Aug. 15.]

The express train, with those of the survivors of the Last Island calamity, rescued by the steamboat F. X. Aubrey, whose destination was this city, arrived at Algiers at an early hour this morning. By it we have further particulars respecting the awful occurrence.

Among those who arrived in the train were Dr. Jones Lyle and Mr. W. D. Winter. They had taken active share in the perils and labors of the trying occasion, from the first moment to the last. In giving their account of it, we omit repetition of what has already reached us, as far as the hurry and disconnected manner in which we are compelled to take it will allow.

They inform us that the storm commenced about 10 o'clock on Sunday morning, and a faithful picture of the calamity they declare to be beyond realization. The gale did not abate till Monday morning, and then the rain continued almost without intermission up to the time of their leaving the island, at times the winds rising pretty strongly again. The number of the victims they estimate at over 200, at least 182 having been already counted. The island was swept by two o'clock on Sunday, having been overflowed between noon and that hour. The wind blew first from the north, and the northern part of the island was then overflowed. Next the wind came from the east, which beat the water off from the north side of the island; afterwards the wind shifted to due south, and then the island became overwhelmed by the waters of the Gulf. Horses, cattle, and even fish, lay strewn dead about the island among the human victims of the storm. It is believed that many bodies were washed out into the Gulf.

We have no definite information from Caillou Island; but there is no doubt that there was great loss of life there. Some thirty bodies are reported to have been found on one end of the island.

On the coast sugar houses and other buildings have been blown down.

The steamboat Major F. X. Aubrey got down to Last Island by about three o'clock yesterday morning, and left on her return at about half-past ten o'clock, taking on board all the survivors except some families from Plaquemine, who were awaiting the arrival of the steamboat Blue Hammock, which was seen going in as the F. X. Aubrey left. Five steamboats were met going down to the assistance of the survivors, but some of them, finding they were not wanted, returned.

The F. X. Aubrey got to Berwick's Bay with those saved, at half-past 8 o'clock last night. The express train was found awaiting them, and getting into the cars, they were in Algiers by half-past 3 o'clock this morning. They were brought in free of all charge on the Opelousas Railroad.

Many of the survivors were severely wounded by floating timber and by being dashed about by the waves; and we regret to learn that it required all the energies and courage of the stout hearts that were there to secure them and the ladies and children saved a position on the hull of the wrecked steamboat Star.

At first, as this vessel was borne to and fro in the raging elements, and it became necessary to cut away her cabin to prevent her from sinking, it was thought as she consequently became lost to sight, that even the refuge of her wrecked hull was lost, and most of the sufferers gave themselves up as doomed.

In addition to this account we are favored with the following letter from Mr. Duperier, giving an account of the catastrophe, with a list of those ascertained to be dead, which it will be seen corrects many errors in the lists already received, and adds some names—and also with a list of the survivors.—

BAYOU BŒUF, August 14, 1856.

DEAR PIC—You may have heard ere this reaches you of the dreadful catastrophe which happened on Last Island, on Sunday, the 10th inst. as one of the sufferers it becomes my duty to chronicle one of the most melancholy events which has ever occurred. On Saturday night, the 9th inst., a heavy northeast wind prevailed, which excited the fears of a storm in the minds of many; the wind increased gradually until about 10 o'clock on Sunday morning, when there existed no longer any doubt that we were threatened with imminent danger. From that time the wind blew a perfect hurricane; every building upon the island giving way, one after another, until nothing remained. At this moment, every one sought the most elevated point on the island, exerting themselves at the same time to avoid the fragments of the buildings, which were scattered in every direction by the wind. Many persons were wounded; some mortally. The water at this time (about 2 o'clock P. M.) commenced rising so rapidly from the bay side, that there could be no longer any doubt that the island would be submerged. The scene at this moment forbids description. Men, women and children were seen running in every direction, in search of some means of salvation. The violence of the wind, together with the rain, which fell like hail, and the sand which blinded their eyes, prevented many from reaching the objects they had aimed at.

At about 4 o'clock the bay and Gulf currents met and the sea waved over the whole island. Those who were so fortunate as to find some object to cling to were seen floating in all directions. Many of them, however, were separated from the straw to which they clung for life and launched into eternity; the others were washed away by the rapid current, and drowned before they could reach their point of destination. Many were drowned from being stunned by scattered fragments of the buildings, which had been blown asunder by the storm; others were crushed by the floating timbers and logs, which were removed from the beach and met them on their journey. To attempt a description of this sad event would be useless. No words can depict the awful scene which occurred on the nights of the 11th and 12th instant. It was not until the next morning, the 12th, that we could ascertain the extent of the disaster. Upon my return, after having drifted for about twenty hours, I found the steamer Star, which had arrived the day before, and was laying at anchor, a perfect wreck, nothing but her hull and boilers, and a portion of her machinery remaining. Upon this wreck the lives of a large number were saved. Towards her each one directed his path as he was recovered from the deep, and was welcomed with tears by his fellow sufferers, who had been so fortunate as to escape. The scene was heart rending—the good fortune of many a poor individual, in being saved, was blighted by the news of the loss of a father, brother, sister, wife, or some near relative. I will not prolong the detail of this unparalleled catastrophe, but will give you the list, as correctly as I could obtain it, of those who were lost:—

Mr. Batey, lady, four children and two servants; A. M. Foley, lady and two servants; Adrian Frere, lady and son; Gabriel Grevunberg, Gaspard Ratin, Thos. Mills, lady and three servants; Homer Mills, lady and child; Michel Schlatre, lady, seven children and six servants; John Muggah, wife, two children and five servants; Jas. Muggah and son, John Barlaffey, Mrs. B. A. Prewett and two servants; Ida Magill, Augustin Magill, Mrs. Crozier and three servants; Mrs. Bordis and servant, H. Landry and three servants, Michel Landry, Joseph Dugas, Ulysse Simoneau, Joe (waiter,) servant of Mr. Trousdale, C. A. Barilleau, child and servant of W. W. Pugh, Jean Avet, Wm. Rochelle, Achille Hebert, wife, child and servant; Mrs. T. Landry, two children and four servants; Mrs. A. Comeau, five children and four servants; L. H. Prewett, Jr., Mrs. D. Rentrop, daughter and servant, Mr. Turner, lady and servant; Mr. Reed, wife, child and two servants; Mrs. Flash and child; sister of Mrs. Flash and child; Mrs. Thos. Maskell; three children and one servant; Mr. Midnight, two servants of Mr. Ellis; Mr. Case P. Robinet, Simon Gimble, Levi Leap, Mrs. Eloi Herbert, Mrs. Emeline Babin, Mr. Homer Herbert, Mr. Stewart, Miss Fisher, Col. Fisher, Mr. Thompson, lady and three servants; Mr. McDonald, servant of Wm. Beland, servant of Joshua Baker, Mr. Royster and lady, negro man of Cheyney Johnson; Lewis, Steward; Jane, Chambermaid; servant of Mrs. Devalin, servant of Mrs. Meade, child of J. Elie, and servant; servant of D. Berand, servant of Jonas Marsh, Mrs. Gerand and child, servant of Dr. Hawkins, servant of Mrs. Harris, Mrs. Roumage and servant, Mrs. Voisin and daughter, Mrs. S. Babin, Mrs. Eloi Babin, Mrs. Boudreaux, Mrs. Bell, John Schneider, F. Fitzpatrick, servant of G B. Briant, two children of Mr. Boutiton, Tom, free negro; Harriet, slave of D. Muggah; two children of Mr. Hudgins.

As I before stated, not a single building withstood the storm. The loss of property is immense, amounting to at least $100,000; the principal sufferers being John Muggah & Co., Thomas Maskell, P. C. Bethel, Gov. Hebert, Thos. Mills, L. Desobry, Lynch, Nash, A. Aman, and others. The loss of baggage belonging to the visitors on the island at the time, which is complete, amounts to at least $5,000, besides about $15,000 in money on those who were drowned, which was nearly all recovered by a set of pirates who inhabit the island; the bodies of those who were recovered had been invariably robbed by these men. It was an awful scene to see the avidity of these heartless beings to pillage the dead. I hope that the hand of justice will take hold of them, and dispose of them as they deserve.

I cannot terminate the report of this sad event without lauding the zeal of all the survivors in rendering to each other mutual assistance; the self-denial and zeal displayed by Capt. Smith, of the steamer Star, and his officers, and of Capt Thomas Ellis, of Terrebonne, deserves special commendation. The thanks of the survivors are also due to Capt. Atchison, of the Major Aubrey; Capt. Meyneer, of the Orion; Capt. Dardennes, of the Blue Hammock; and Judge Baker, who came to the relief of the sufferers as soon as they heard the news of the disaster. The following is a list of the survivors:—

Dr. Baggerly, wife, nephew and niece, Miss C. Hartman, Mr. Crank, Mr. Johnson, lady and four children, R. Trousdale, J. K. Smith, Miss Camelia Nash, Miss Eliza[beth] Nash, Miss Roberta Nash, C. B. Bayhes, wife and ch[ild], L. Desobyand and wife, Mrs. Dardennes and five c[hil]dren, Miss H Clements, Miss L. Clements, R. S. McC[ol]ter, W. D. Winter and servant, Thos. H. Ellis and servants, S. B. Murphy, Miss Mastherson, Dr. J. F. H[aw]kins, wife and child, Capt. Gates and wife, Mrs. H[...] and child, Mrs. Dr. Lyman and child, W. J. Nash, Miss Mary Nash, Miss Parmelia Nash, Miss Harriet N[ash], Antoine Corneang child and servant, T. Landry, A[...] Wadsworth, Dr. B. A Prewett and two servants, G. Briant, Miss Emma Mills, John Davis, wife and two [chil]dren, Henry Muggah, Dr. Wm. Jones Lyle, Capt. R[...]gah, wife and four children; J. L. Lewis, wife, mo[ther,] three servants; Jonas Marsh and daughter, W. W. P[ugh,] lady, six children and servant; Miss Nichols, a serv[ant] of Dr. Batey, a servant of Mr. Foley, Franklin Pugh, sire Leblanc and servant, Aristide Leblanc, E. Lafo[...] V. H. Rentrop and two daughters, G. Herbert and la[dy,] L. C. Gotterman, Chas. Rhein, E. Lecosta, A. B. Gary, C. Simms and wife, Mrs. Birdsall and son, Thos. Ma[skell,] two children and six servants; F. B. Jackson, Dr. [...] Mrs. S. E. King, Miss Caroline King, Adolph Rochel[le,] E. Tyler, Louis Greremberg, Miss Brunette, Mrs. C[...]per, two children and servants; Desiré Bernard, lady [and] two children; E. S. Astill and lady, Mrs. Flash and la[dy,] Mrs. Voirin, M'me Baptiste, Mrs. Giraud, Dr. A. Dup[...]

A SUFFERER.

It is deeply to be regretted that the bodies of mo[st of] the victims were plundered as above stated; but the [...] is beyond question, although every effort was m[ade] where possible, to prevent it.

The interment of bodies found exposed, was caref[ully] attended to; but in a great number of instances, the [ele]ments had done the work. The waters carried a d[epth] of several feet of sand and debris, on some parts of [the] island, and have everywhere so changed its surface, [that] those formerly acquainted with it, could no longer re[cog]nize it. Many bodies rest beneath the grave thus m[ade] for them by nature. Peace to their names!

MORE DISASTERS IN THE LATE STORM.

We learn from Capt. W. S. Brown, who came up on [the] towboat Conqueror, this morning, that the schooner G[...] Montague, Capt. Butler, from Havana, bound up to [this] city, was blown ashore on Saturday night last, [near] the telegraphic station at the Southwest P[ass.] Two towboats were at work at her on Mo[nday] last trying to pull her off, but without success, and will be obliged to lighter off, or lie there until there i[s] be a sufficient rise of water to enable her to get off.

We are also informed that the British schooner [...]chester, from Belize, Hon., with a cargo of cedar [and] fruit, was blown ashore at the same time on South P[ass] and was completely wrecked. The captain, crew [and] passengers formed a raft, and arrived at the South Pass Pilot Station on Monday last. The crew, all of w[hom] are colored, were placed on the schooner G. H. Monta[gue] and her passengers, Messrs. Alexander and Goodr[ich] came up to the city on the Conqueror. From them [we] learn that a large and destructive fire took place at Belize a few days previous to the schooner's lea[ving] which caused a loss of some $500,000 worth of prop[erty.]

The lighthouse at the Southwest Pass was careened [by] the severe blow on Saturday, and the look out at the [pi]lot station was entirely demolished. Many of the ho[uses] at the station were badly damaged. The telegra[ph] house was twisted entirely around.

Police Intelligence.

SUCCESSFUL SWINDLE—GOLD DUST OPERATION—[PER]SONATING POLICEMEN—CAPTURE OF ONE OF [THE] ACCUSED PARTIES.

Justaf Michael, a German pedlar, doing busine[ss in] Houston street, was arrested yesterday morning b[y Of]ficer Masterton, of the Chief's office, on complaint o[f Pe]ter Schmidt, a German watchmaker, doing busine[ss at] 192 Eldridge street, who charges him with having, in [con]nection with other parties, defrauded him out of $[...] under the following circumstances:—In the mon[th of] March last the complainant, who is in the ha[bit of] buying and selling gold dust for mechanical pur[poses,] was visited by a pedlar named Oppenheimer, who [pur]chased some gold dust and then departed. Some [time] after this, as the complainant alleges, Oppenheime[r re]turned, and said that the gold dust was stolen prop[erty,] and that Schmidt would be likely to get himself [into] trouble. The story of the pedlar was a very unple[asant] one to Schmidt, who, half frightened to death, ima[gined] himself on the way to Sing Sing ere Oppenheimer [took] his leave the second time. The fellow hinted that Schmidt would probably have the pleasure [of] serving the State of New York for twenty y[ears] to come, and succeeded completely in his de[sign.] Some days after the bad news reached the ears o[f the] watchmaker, and just as he was thinking over the e[vents] of the pre-ceding day, two men entered the store, stating that they were policemen in disguise, [and told] Schmidt that he had been buying a large quant[ity of] stolen gold dust, and that he was booked for Sing [Sing.] They intimated they had been after him for a long [time] past, and had spent about $1,200 in looking up the [case,] but they said they were repaid for all their trouble, [as they] at last had captured the bird. The mock policemen questioned Schmidt as to his property and means of [get]ting out of a bad scrape, should he be unlucky enou[gh to] be placed on trial. The jeweller freely told them e[very]thing concerning himself and family. He said [he] had $2,000 in the Seamen's Savings Bank, in [...] street, and was otherwise well to do in the world. A mention of the $2,000 the sharpers pricked up their [ears] and suddenly became quite sympathetic. They di[d not] like the idea of separating Schmidt from his family, but they had been at great expense in hunting up the re[ceiv]er of stolen goods, and could not negotiate except [on] some substantial basis. The $2,000 lodged for safe [keep]ing in the savings' bank would just defray the e[...] expenses of the delicate piece of business; and if ha[nded] over to them, why they would settle the case, a[nd no] more trouble would lay at Schmidt's door. The watchmaker was in agony. To part with the res[ult of] several years' hard earnings was really too bad; then, on the other hand, the State prison, with all it[s ter]rors, appeared, not in the distance, but within a fe[w mi]nutes' walk of his store door. He had no choice le[ft] but freedom or slavery. He chose the former, [and] handed the money (all in gold, too) over to the [swin]dlers. After some weeks' reflection on the above t[rans]action, Schmidt gradually became of opinion that h[e had] been swindled. He made strict inquiries about the [gold] dust he had purchased, and found that all was [per]fectly correct. It needed but little now to [con]vince him that he had been made the dupe of cunning rascals, and acting under that belief made a complaint against them before Justice [Con]nolly, at the Lower Police Court. The magistrate, [how]ever, could not issue warrants for parties whose n[ames] and whereabouts were unknown, and so Schmidt [was] obliged to wait in order that the accused parties mig[ht be] ferretted out. The complainant from that time for[th] was on the lookout for the individuals who "did hi[m] brown," and yesterday morning succeeded in proc[uring] the arrest of Michael just as he was entering a Bo[...] stage, opposite French's Hotel. The prisoner [was] brought before Justice Connolly, at the Lower P[olice] Court, yesterday forenoon, where he was committ[ed for] examination. A lengthy affidavit embracing all o[f the] above facts has been made by the complaint. No[thing] has yet been obtained to the companion of Michael. [The] unknown party seems to have been the leading sp[irit in] the transaction, for he it was that personated the C[hief's] right hand man, while Michael was merely his sub[ordi]nate. The latter, however, arranged the financial [part] of the business, got possession of the funds, and, a[s is] supposed, shared the proceeds with the unknown.

CHARGE OF BIGAMY—A SAILOR WITH THREE WI[VES.]

Thomas McGrath, a sailor, was arrested by Ser[geant] Smith, of the Lower Police Court, on charge of big[amy] preferred against him by three women, to whom he [had] been married at different periods. Fifteen years [ago] Thomas married Ellen Welch, by whom he has a [child] (now living) thirteen years old. Three years ag[o he] again entered into the holy bonds of matrimony, and Miss Anne Brady to be his wedded wife. Some m[onths] ago, while his two first wives were alive and undiv[orced] from him, he again contracted a third marriage, an[d es]poused Miss Abbey Hegarty, of Boston. To-day the deceiver will be brought up for examination, whe[n the] three wives will meet him face to face, and standin[g out] in bold relief, they will afford the magistrate the convincive proofs of McGrath's guilt. Sailors are [apt] to have more than one wife at a time, so but little a[stonish]ment is manifested at McGrath's love of the fair s[ex in] general.

COMPLAINT DISMISSED.—The complaint against J. Ed[...] Duff, broker, for false pretences, preferred against [him] by Mr. Isaac Ayres, has been dismissed, and the acc[used] has been honorably discharged.

Supreme Court—In Chambers.

Before Hon. Judge Davis.

A CURIOUS CASE OF HABEAS CORPUS.

AUG. 21.—*In the matter of Katy Smith or Cath[erine] Stewart.*—This case of habeas corpus of an illegit[imate] child was resumed this morning.

George Hamilton was examined for the petitioner ([...] Smith) and deposed, that he resides in Duanes[burg,] Schenectady county; he has in his care now anoth[er fe]male child of the petitioners, aged four years; he [has a] wife and no children of his own; he has adopted the [peti]tioner's first child as his own; he has proposed to [take] and adopt this little girl (now claimed); is willing to [take] it and adopt it as his own; witness is worth about $30[...] and he proposes to make a will and leave them (the children) his property as though they were his own; [he] is willing to take this child and treat it as his own, [it] shall share his property; he knows the father of the [chil]dren; is in correspondence with him; he (the fathe[r) is] at present in Nicaragua with General Walker.

The mother remarked to the Judge that since the [child] was last in Court the respondents (Mr. and Heubish) cut its curls off; she was willing that the child shou[ld be] given to Mr. Hamilton.

The Judge told Mrs. Heubish that the child s[hould] be in Court in the morning, and admonished he[r not] to do anything to or interfere with its appear[ance] so as to displease its mother. His Honor then said he would give the child to the care of Mr. Hamilto[n, on] his giving security for its proper support and educ[ation.] He would refer the matter to Mr. Bertholf to ascerta[in the] solvency and respectability of Mr. Hamilton, and giv[e a] decision in the morning.

Mr. Hamilton said he wished to give another r[eason] why he was desirous of having the child, and that [was] its father was a brother Freemason of his and belo[nged] to the same lodge with him.

It was mentioned in the court room that Mr. Ham[ilton] was formerly a Judge of the Court of Common Ple[as of] Schenectady county.

In the Matter of the Park Bank—The President o[f the] Park Bank vs. the Mayor and Supervisors of New Yo[rk.] This was a motion made by Messrs. Lockwood and T[ownsend] to restrain the defendants from levying on the [...] $21,000 as taxes, for which that company is asse[ssed.] They contend that the bank, not being in operation [a] year, is not liable to taxation.

The Corporation Counsel, Mr. L. B. Shepard, app[eared] for the Supervisors, and contended that as the bank since its commencement made one per cent a mon[th on] its capital stock, it was liable to taxation. Decisio[n re]served.